CLAIMS

1. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts (12, 18) which are angularly movable relative to each other and having an inner circumferential surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

a plurality of balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows (36) retaining said balls (28), respectively, therein,

wherein each of said first guide grooves (26a - 26f) has a transverse cross section extending perpendicularly to said axial direction and having a single arcuate shape, each of said first guide grooves (26a - 26f) being held in contact with a corresponding one of the balls (28) at a single point, and

wherein each of said second guide grooves (32a - 32f)

has a transverse cross section extending perpendicularly to said axial direction and having elliptically arcuate shape, each of said second guide grooves (32a - 32f) being held in contact with a corresponding one of the balls (28) at two points.

2. A constant-velocity joint according to claim 1, wherein ratios of a radius (M) of each of said first guide grooves (26a - 26f) in a transverse cross section thereof and radiuses (P, Q) of each of said second guide grooves (32a - 32f) in a transverse cross section thereof to a diameter (N) of said balls (28) are set in a range from 0.51 to 0.55, a contact angle of each of the balls (28) with respect to one of said first guide grooves (26a - 26f) is set to zero on a vertical line (L) extending across the ball (28), and a contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 13 degrees to 22 degrees from the vertical line (L).

3. A constant-velocity joint according to claim 2, wherein the contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 15 degrees to 20 degrees from the vertical line (L).

4. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having a spherical inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

a plurality of balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein each of said first guide grooves (26a - 26f) has a curved longitudinal cross section extending in the axial direction and having a center (H) of curvature, each of said second guide grooves (32a - 32f) has a curved longitudinal cross section extending in the axial direction and having a center (R) of curvature, and said centers (H, R) of curvature are offset oppositely in the axial direction by equal distances (T) from a center (K) of said spherical inside-diameter surface, and

wherein the ratio V (T/N) of each of the distances (T)

by which said centers (H, R) of curvature are offset from said center (K) of said spherical inside-diameter surface to the diameter (N) of said balls (28) is set to satisfy the expression $0.12 \leq V \leq 0.14$.

5. A constant-velocity joint according to claim 4, wherein each of said first guide grooves (26a - 26f) has a transverse cross section extending perpendicularly to said axial direction and having a single arcuate shape, each of said first guide grooves (26a - 26f) being held in contact with a corresponding one of the balls (28) at a single point, and

wherein each of said second guide grooves (32a - 32f) has a transverse cross section extending perpendicularly to said axial direction and having elliptically arcuate shape, each of said second guide grooves (32a - 32f) being held in contact with a corresponding one of the balls (28) at two points.

6. A constant-velocity joint according to claim 5, wherein ratios of a radius (M) of each of said first guide grooves (26a - 26f) in a transverse cross section thereof and radiuses (P, Q) of each of said second guide grooves (32a - 32f) in a transverse cross section thereof to a diameter (N) of said balls (28) are set in a range from 0.51 to 0.55, a contact angle of each of the balls (28) with respect to one of said first guide grooves (26a - 26f) is

set to zero on a vertical line (L) extending across the ball (28), and a contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 13 degrees to 22 degrees from the vertical line (L).

7. A constant-velocity joint according to claim 6, wherein the contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 15 degrees to 20 degrees from the vertical line (L).

8. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inner circumferential surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member

(16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein said first guide grooves (26a - 26f) have a pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a PCD clearance represented by a difference between said outer PCD and said inner PCD (the outer PCD - the inner PCD) is set in a range from 0 to 100 μm.

9. A constant-velocity joint according to claim 8, wherein a spherical clearance established as a sum of a difference between an outer member inner-spherical-surface diameter which is a diameter of an inside-diameter surface of said outer member (16) and a retainer outer-spherical-surface diameter which is a diameter of an outer surface of said retainer (38), and a difference between a retainer inner-spherical-surface diameter which is a diameter of an inner surface of said retainer (38) and an inner ring outer-spherical-surface diameter which is a diameter of an outer surface of said inner ring (34) is set in a range from 50 to 200 μm in accordance with the following expression:

$$50\ \mu m \leq \{(\text{outer member inner-spherical-surface diameter}) - (\text{retainer outer-spherical-surface diameter})\} + \{(\text{retainer inner-spherical-surface diameter}) - (\text{inner ring outer-spherical-surface diameter})\} \leq 200\ \mu m.$$

10. A constant-velocity joint according to claim 8, wherein each of said retaining windows (36) of the retainer (38) has a transverse center which is offset from a center of spherical outer and inner surfaces of said retainer (38) in an axial direction of the retainer (38) by a distance ranging from 20 to 100 μm.

11. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein said first guide grooves (26a - 26f) have a pitch circle diameter represented as an outer PCD, said

second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq 2.2$.

12. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein said first guide grooves (26a - 26f) have a

pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a ratio (Db/Dp) of a diameter (Db) of said balls (28) to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$.

13. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein said first guide grooves (26a - 26f) have a

pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a ratio (Do/Dp) of an outside diameter (Do) of said outer member (16) to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

14. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows retaining said balls (28), respectively, therein,

wherein said first guide grooves (26a - 26f) have a

pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq 2.2$,

wherein a ratio (Db/Dp) of a diameter (Db) of said balls (28) to the dimension (Dp) of the outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$, and

wherein a ratio (Do/Dp) of an outside diameter (Do) of said outer member (16) to the dimension (Dp) of the outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

15. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts which are angularly movable relative to each other and having an inner circumferential surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two

shafts and having an outer circumferential surface having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

a plurality of balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows (36) retaining said balls (28), respectively, therein,

wherein each of said retaining windows (36) has an opening length (WL) extending in a circumferential direction of said retainer (38), and a ratio (WL/N) of said opening length (WL) to a diameter (N) of said balls (28) is set in a range of $1.30 \leq (WL/N) \leq 1.42$.

16. A constant-velocity joint according to claim 15, wherein each of said retaining windows (36) has corners (36a) each having a radius (R) of curvature, and a ratio (R/N) of said radius (R) of curvature to the diameter (N) of said balls (28) is set in a range of $0.23 \leq (R/N) \leq 0.45$.

17. A constant-velocity joint according to claim 15, wherein each of said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f) has a curved region and a straight region (S1, S2) extending in a longitudinal direction thereof.

18. A constant-velocity joint according to claim 15, wherein each of said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f) has only a curved region extending in a longitudinal direction thereof.

19. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts (12, 18) which are angularly movable relative to each other and having an inner circumferential surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows (36) retaining said balls (28), respectively, therein,

wherein each of said first guide grooves (26a - 26f) has a transverse cross section extending perpendicularly to said axial direction and having a single arcuate shape, each of said first guide grooves (26a - 26f) being held in

contact with a corresponding one of the balls (28) at a single point,

wherein each of said second guide grooves (32a - 32f) has a transverse cross section extending perpendicularly to said axial direction and having elliptically arcuate shape, each of said second guide grooves (32a - 32f) being held in contact with a corresponding one of the balls (28) at two points, and

wherein said first guide grooves (26a - 26f) have a pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a PCD clearance represented by a difference between said outer PCD and said inner PCD (the outer PCD - the inner PCD) is set in a range from 0 to 100 μm.

20. A constant-velocity joint according to claim 19, wherein ratios of a radius (M) of each of said first guide grooves (26a - 26f) in a transverse cross section thereof and radiuses (P, Q) of each of said second guide grooves (32a - 32f) in a transverse cross section thereof to a diameter (N) of said balls (28) are set in a range from 0.51 to 0.55, a contact angle of each of the balls (28) with respect to one of said first guide grooves (26a - 26f) is set to zero on a vertical line (L) extending across the ball (28), and a contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is

set in a range from 13 degrees to 22 degrees from the vertical line (L).

21. A constant-velocity joint according to claim 19, wherein the contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 15 degrees to 20 degrees from the vertical line (L).

22. A constant-velocity joint according to claim 19, wherein a spherical clearance established as a sum of a difference between an outer member inner-spherical-surface diameter which is a diameter of an inside-diameter surface of said outer member (16) and a retainer outer-spherical-surface diameter which is a diameter of an outer surface of said retainer (38), and a difference between a retainer inner-spherical-surface diameter which is a diameter of an inner surface of said retainer (38) and an inner ring outer-spherical-surface diameter which is a diameter of an outer surface of said inner ring (34) is set in a range from 50 to 200 μm in accordance with the following expression:
50 μm ≤ {(outer member inner-spherical-surface diameter) - (retainer outer-spherical-surface diameter)} + {(retainer inner-spherical-surface diameter) - (inner ring outer-spherical-surface diameter)} ≤ 200 μm.

23. A constant-velocity joint according to claim 19,

wherein each of said retaining windows (36) of the retainer (38) has a transverse center which is offset from a center of spherical outer and inner surfaces of said retainer (38) in an axial direction of the retainer (38) by a distance ranging from 20 to 100 μm.

24. A constant-velocity joint according to claim 19, wherein a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq 2.2$.

25. A constant-velocity joint according to claim 19, wherein a ratio (Db/Dp) of a diameter (Db) of said balls (28) to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$.

26. A constant-velocity joint according to claim 19, wherein a ratio (Do/Dp) of an outside diameter (Do) of said outer member to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

27. A constant-velocity joint according to claim 19, wherein a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq 2.2$,

wherein a ratio (Db/Dp) of a diameter (Db) of said balls (28) to the dimension (Dp) of the outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$, and

wherein a ratio (Do/Dp) of an outside diameter (Do) of said outer member (16) to the dimension (Dp) of the outer/inner PCD is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

28. A constant-velocity joint according to claim 19, wherein each of said retaining windows (36) has an opening length (WL) extending in a circumferential direction of said retainer (38), and a ratio (WL/D) of said opening length (WL) to a diameter (D) of said balls (28) is set in a range of $1.30 \leq (WL/D) \leq 1.42$.

29. A constant-velocity joint according to claim 28, wherein each of said retaining windows (36) has corners (36a) each having a radius (R) of curvature, and a ratio (R/N) of said radius (R) of curvature to the diameter (N) of

said balls (28) is set in a range of $0.23 \leq (R/N) \leq 0.45$.

30. A constant-velocity joint according to claim 28, wherein each of said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f) has a curved region and a straight region (S1, S2) extending in a longitudinal direction thereof.

31. A constant-velocity joint according to claim 28, wherein each of said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f) has only a curved region extending in a longitudinal direction thereof.

32. A constant-velocity joint comprising:

an outer member (16) connected to one of two shafts (12, 18) which are angularly movable relative to each other and having a spherical inside-diameter surface having a plurality of first guide grooves (26a - 26f) extending in an axial direction thereof, said outer member (16) having an open end;

an inner ring (34) connected to the other of said two shafts and having as many second guide grooves (32a - 32f) as the number of said first guide grooves (26a - 26f), said second guide grooves (32a - 32f) extending in an axial direction thereof;

six balls (28) rollingly disposed between said first guide grooves (26a - 26f) and said second guide grooves (32a

- 32f), for transmitting a torque between said outer member (16) and said inner ring (34); and

a retainer (38) having retaining windows (36) retaining said balls (28), respectively, therein,

wherein each of said first guide grooves (26a - 26f) has a transverse cross section extending perpendicularly to said axial direction and having a single arcuate shape, each of said first guide grooves (26a - 26f) being held in contact with a corresponding one of the balls (28) at a single point,

wherein each of said second guide grooves (32a - 32f) has a transverse cross section extending perpendicularly to said axial direction and having elliptically arcuate shape, each of said second guide grooves (32a - 32f) being held in contact with a corresponding one of the balls (28) at two points,

wherein said first guide grooves (26a - 26f) have a pitch circle diameter represented as an outer PCD, said second guide grooves (32a - 32f) have a pitch circle diameter represented as an inner PCD, and a PCD clearance represented by a difference between said outer PCD and said inner PCD (the outer PCD - the inner PCD) is set in a range from 0 to 100 μm,

wherein each of said first guide grooves (26a - 26f) has a curved longitudinal cross section extending in the axial direction and having a center (H) of curvature, each of said second guide grooves (32a - 32f) has a curved

longitudinal cross section extending in the axial direction and having a center (R) of curvature, and said centers (H, R) of curvature are offset oppositely in the axial direction by equal distances (T) from a center (K) of said spherical inside-diameter surface, and

wherein the ratio V (T/N) of each of the distances (T) by which said centers (H, R) of curvature are offset from said center (K) of said spherical inside-diameter surface to the diameter (N) of said balls (28) is set to satisfy the expression $0.12 \leq V \leq 0.14$.

33. A constant-velocity joint according to claim 32, wherein ratios of a radius (M) of each of said first guide grooves (26a - 26f) in a transverse cross section thereof and radiuses (P, Q) of each of said second guide grooves (32a - 32f) in a transverse cross section thereof to a diameter (N) of said balls (28) are set in a range from 0.51 to 0.55, a contact angle of each of the balls (28) with respect to one of said first guide grooves (26a - 26f) is set to zero on a vertical line (L) extending across the ball (28), and a contact angle (α) of each of the balls (28) with respect to one of said second guide grooves (32a - 32f) is set in a range from 13 degrees to 22 degrees from the vertical line (L).

34. A constant-velocity joint according to claim 32, wherein the contact angle (α) of each of the balls (28) with

respect to one of said second guide grooves (32a - 32f) is set in a range from 15 degrees to 20 degrees from the vertical line (L).

35. A constant-velocity joint according to claim 32, wherein a spherical clearance established as a sum of a difference between an outer member inner-spherical-surface diameter which is a diameter of an inside-diameter surface of said outer member (16) and a retainer outer-spherical-surface diameter which is a diameter of an outer surface of said retainer (38), and a difference between a retainer inner-spherical-surface diameter which is a diameter of an inner surface of said retainer (38) and an inner ring outer-spherical-surface diameter which is a diameter of an outer surface of said inner ring (34) is set in a range from 50 to 200 μm in accordance with the following expression:
50 μm ≤ {(outer member inner-spherical-surface diameter) - (retainer outer-spherical-surface diameter)} + {(retainer inner-spherical-surface diameter) - (inner ring outer-spherical-surface diameter)} ≤ 200 μm.

36. A constant-velocity joint according to claim 32, wherein each of said retaining windows (36) of the retainer (38) has a transverse center which is offset from a center of spherical outer and inner surfaces of said retainer (38) in an axial direction of the retainer (38) by a distance ranging from 20 to 100 μm.

37. A constant-velocity joint according to claim 32, wherein a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq 2.2$.

38. A constant-velocity joint according to claim 32, wherein a ratio (Db/Dp) of a diameter (Db) of said balls (28) to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$.

39. A constant-velocity joint according to claim 32, wherein a ratio (Do/Dp) of an outside diameter (Do) of said outer member (16) to a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

40. A constant-velocity joint according to claim 32, wherein a ratio (Dp/D) of a dimension (Dp) of an outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, to a diameter (D) of an inner-ring serrated-region inside-diameter surface on an inner wall of said inner ring (34) is set in a range of $1.9 \leq (Dp/D) \leq$

2.2,

wherein a ratio (Db/Dp) of a diameter (Db) of said balls (28) to the dimension (Dp) of the outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $0.2 \leq (Db/Dp) \leq 0.5$, and

wherein a ratio (Do/Dp) of an outside diameter (Do) of said outer member (16) to the dimension (Dp) of the outer/inner PCD, which represents the outer PCD and the inner PCD that are equal to each other, is set in a range of $1.4 \leq (Do/Dp) \leq 1.8$.

41. A constant-velocity joint according to claim 32, wherein each of said retaining windows (36) has an opening length (WL) extending in a circumferential direction of said retainer (38), and a ratio (WL/N) of said opening length (WL) to a diameter (N) of said balls (28) is set in a range of $1.30 \leq (WL/N) \leq 1.42$.

42. A constant-velocity joint according to claim 41, wherein each of said retaining windows (36) has corners (36a) each having a radius (R) of curvature, and a ratio (R/N) of said radius (R) of curvature to the diameter (N) of said balls (28) is set in a range of $0.23 \leq (R/N) \leq 0.45$.

43. A constant-velocity joint according to claim 41, wherein each of said first guide grooves (26a - 26f) and

said second guide grooves (32a - 32f) has a curved region and a straight region (S1, S2) extending in a longitudinal direction thereof.

44. A constant-velocity joint according to claim 41, wherein each of said first guide grooves (26a - 26f) and said second guide grooves (32a - 32f) has only a curved region extending in a longitudinal direction thereof.